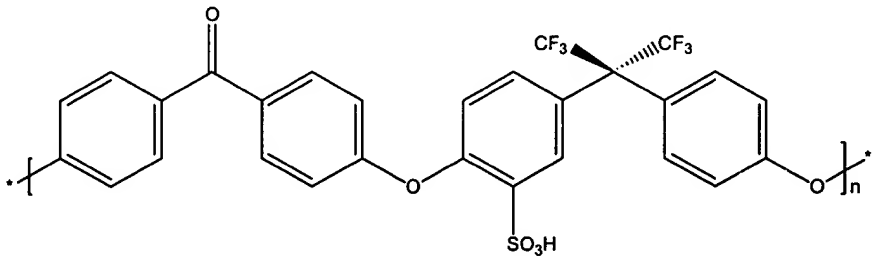
repeating structural unit of the formula III

$$-O\text{-}Ar^3(SO_3R)_n\text{-}O\text{-}Ar^2\text{-}(Z\text{-}Ar^2)_m- \qquad (III),$$

in which Ar^2, R, m and n have the meaning defined in claim 1, Z is a -CO-, -O-, $-C_pH_{2p}$-, $-C_pF_{2p}$-, -S- or $-SO_2$- group in which p is an integer from 1 to 10, and Ar^3 is a divalent aromatic or heteroaromatic radical which is optionally substituted by one or more monovalent organic groups which are inert under the conditions of use.

22. The sulfonated aromatic polymer as claimed in claim 21, wherein the molar proportion of the repeating structural unit of the formula I is 10-50% and the molar proportion of the repeating structural unit of the formula III is 90-50%.

23. The sulfonated aromatic polymer as claimed in claim 1, which consists essentially of the repeating structural unit of the following formula:



24. The sulfonated polymer as claimed in claim 1, which has an ion exchange capacity of between 0.5 and 3.0 meq ($-SO_3H$)/g of polymer.

25. A membrane comprising the sulfonated polymer as claimed in claim 1.

26. The membrane as claimed in claim 25, which has a proton conductivity in contact with

liquid water, determined by impedance spectroscopy in water at 80°C, of between 120 and 350 mS/cm.

27. The membrane as claimed in claim 25, which comprises as further polymer component a sulfonated, aminated or else underivatized aromatic polymer.

28. The membrane as claimed in claim 25, which has a thickness of between 10 and 150 μm.

29. A method for producing a membrane as claimed in claim 25, comprising the steps of:

(i) dissolving a sulfonated aromatic polymer comprising the repeating structural unit of the formula (I) or its salt form,

$$-O\text{-}Ar^1(SO_3R)_n\text{-}C(CF_3)_2\text{-}Ar^1(SO_3R)_n\text{-}O\text{-}Ar^2\text{-}(X\text{-}Ar^2)_m- \qquad (I),$$

in which Ar^1 and Ar^2 are, independently of one another, divalent aromatic or heteroaromatic radicals which are optionally substituted by one or more monovalent organic groups which are inert under the conditions of use or sulfonic acid groups, R is hydrogen, an alkali metal or alkaline earth metal ion or an ammonium ion, n is an integer from 0 to 3, m is 0, 1 or 2 and X is a -CO-, -O-, $-C_pH_{2p}-$, $-C_pF_{2p}-$ or -S- group, in which p is an integer from 1 to 10,

in an aprotic organic solvent,

(ii) spreading the solution on a support, and

(iii) evaporating the solvent to form the membrane.

30. The method for producing a membrane as claimed in claim 29, wherein the solution is DMF, DMAC, NMP or DMSO and said polymer has a concentration being between 3 and 30% by weight.

31. The method for producing a membrane as claimed in claim 29, wherein the salt forms of the polymer are employed and wherein the salt forms can be converted into the acid form by treatment with an acid after production of the membrane.

32. The method for producing a membrane as claimed in claim 29, wherein the remaining solvent or salts are removed after the membrane production by a washing medium.

33. The sulfonated aromatic polymer as claimed in claim 2, wherein Ar^1 and Ar^2 are, independently of one another, 1,3- phenylene or 1,4-phenylene.

34. The sulfonated aromatic polymer as claimed in claim 1, wherein Ar^1 and Ar^2 are, independently of one another, 1,3- phenylene or 1,4-phenylene.

35. The sulfonated aromatic polymer as claimed in claim 2, which further comprises the repeating structural unit of the formula III

$$-O\text{-}Ar^3(SO_3R)_n\text{-}O\text{-}Ar^2\text{-}(Z\text{-}Ar^2)_m- \qquad (III),$$

in which Ar^2 is a divalent aromatic or heteroaromatic radicals which is optionally substituted by one or more monovalent organic groups which are inert under the conditions of use or sulfonic acid groups,

R is hydrogen, an alkali metal or alkaline earth metal ion or an ammonium ion,

n is an integer from 0 to 3,

m is 0, 1 or 2,

Z is a -CO-, -O-, $-C_pH_{2p}-$, $-C_pF_{2p}-$, -S- or $-SO_2-$ group in which p is an integer from 1 to 10, and Ar^3 is a divalent aromatic or heteroaromatic radical which is optionally substituted by one or more monovalent organic groups which are inert under the conditions of use.